

## CALIFORNIA MICROLEPIDOPTERA IV

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*Sacramento, California*

These are four species of the family Gelechiidæ. The first is a small species which runs to the genus *Epithectis* in Meyrick's key (*Genera Insectorum*, fasc. 184), and which does not fit the description of any recorded species. The white sub-apical fascia and apical markings are the apparent features of this species.

***Epithectis californica* Keifer, new species**

Second joint of palpi grayish fuscous, unevenly whitish on inner side and above, and narrowly white at apex; terminal joint whitish, extreme base fuscous and entire anterior edge and tip blackish. Antennæ dark fuscous, somewhat whitish below, especially basally. Head, thorax, abdomen and legs shining gray. Ground color of forewing dull white, but entirely overlaid and almost completely obscured by grayish fuscous. Basal half of wing light grayish fuscous with a few indistinct marks. Apical half distinctly darker and contrastingly marked. Costa at extreme base dark fuscous. Fold with a dark fuscous blotch just within the basal fourth, and another at one-third, a white infusion of scales between them and after the second in the fold; the second mark the larger, probably indicating the plical stigma. Discal stigmata dark fuscous, small, indistinct, the first at one-half, the second at the apical third. A short, outwardly pointed and oblique blackish mark on costa above first discal stigma, followed by a white infusion and then the dark fuscous edging on the inner side of the white fascia. Fascia rather narrow (angled with apex pointing outward) from costa just beyond two-thirds, extending obliquely outward to just below central line of wing at apical fifth, thence abruptly running back to tornus, slightly interrupted just below angle. Extreme apex with a white dot; evenly spaced between this and the fascia on the costa are two short white marks; a conspicuous black dash contiguous to the lower side of the apical white dot; a white line in cilia around apex; cilia light fuscous. Hindwing whitish overlaid light fuscous, giving a general gray appearance. Expanse,  $7\frac{1}{2}$  to  $9\frac{1}{2}$  mm.

Type, male, No. 2963, Museum California Academy of Sciences, taken near Fair Oaks, Sacramento County, California, by the writer on September 19, 1928. Allotype, female, No. 2964, Museum California Academy of Sciences, with same data. Forty-one paratypes also have this same locality and date. These paratypes are in the collection of Miss Annette

F. Braun, the United States National Museum, the author's collection, and the Academy collection.

The male genitalia, as shown by paratypes designated in the Academy collection and the author's collection, are chiefly characterized by spines around the ædœagus and the large ventral plates. These ventral plates touch each other midventrally and are emarginate apically, ending in a short midventral projection and a longer finger-like process opposite the shorter projection, just below each harpe (see Figs. 1a, 1b). The male genitalia of a specimen of *E. attributella* Walk. furnished by Miss Braun have been examined. In this species there is a suggestion of the ventral plates as in *californica*, the ædœagus is similar to the local species, and the harpes are about as long though differently shaped; but the uncus and gnathos are radically different. Specimens from Oroville and Marin County which cannot be separated from *californica* by wing pattern have genitalia markedly at variance with the Sacramento County form and therefore are not included at the present. They may prove to be members of one quite variable species.

The next three species are of the type genus and are associated in having the same or closely related food plants. These plants are of the Ericaceæ and are Madrone (*Arbutus manziesii* Pursh.) and Manzanita (*Arctostaphylos* spp.). The moths differ according to the following synopsis:

#### ADULTS

- A. Almost entirely reddish or brick red; male genitalia with a short broad uncus and harpes apparently double.....  
.....*Gelechia panella* Busck
- B. Grayish black with bluish or purplish reflections and a black rather elongate triangle on dorsal base of forewings; male genitalia with uncus slender and produced, harpes simple, vinculum with large median posterior lobe.....  
.....*Gelechia arbutina* n. sp.
- C. Grayish black with bluish or purplish reflections and an outwardly oblique black bar across central line of wing near base; male genitalia with uncus produced and slender, harpes simple, vinculum with two posterior lobes.....  
.....*Gelechia manzanita* n. sp.

#### LARVÆ

- A. Yellow green with three prominent dorsal longitudinal pinkish purple stripes; found on Manzanita and Madrone.....  
.....*Gelechia panella* Busck

- B. Yellow green, noticeably irrorated with fine black dots; found on Madrone only.....*Gelechia arbutina* n. sp.
- C. Yellow green with a reddish purple subdorsal longitudinal stripe, or this stripe fuscous (sometimes faint and shortened); found on various species of Manzanita....*Gelechia manzanita* n. sp.

***Gelechia arbutina* Keifer, new species**

The scales of this moth are light in color at the extreme base, almost white, but heavily pigmented dark grayish or blackish on most of the scale, which is often tipped a lighter shade. The general effect is deep gray with black spots and a bluish, coppery or purplish irridescence.

Palpi with second joint dark grayish fuscous, brush large, longer at base, irrorated whitish, the joint somewhat overlaid whitish on inner side posteriorly, especially near base; terminal joint blackish fuscous, irrorated and marked whitish or ochreous whitish: an annulus just above base, tip white. Head deep grayish fuscous, face on some specimens lighter; thorax as head above, the lighter irroration not very contrasting. Abdomen sordid whitish, darker toward tip and below. Forewing the same as the head and thorax, but with more contrasting irroration, scale tufts, and black marks, and a white subapical fascia. A small black spot within the costa near base, often followed by two or three more. A comparatively large deep black triangle near dorsal base, somewhat elongate longitudinally, its inner and most attenuate point touching dorsal edge near base, its outer angle ending in the fold and partly on the edge of a scale tuft by the fold at basal fourth, the costal angle ending a short distance across the fold and near central line of wing. A second tuft at basal third on disk; a third, small, obliquely below and beyond second, on the fold. A conspicuous moderately narrow whitish fascia, slightly curved or angled, extends from costa, just after beginning of costal cilia, to tornus. A large blackish area from the last two scale tufts to the fascia, the costal edge of this area extending from well within costa near the second scale tuft to the costa at or just before the fascia, the dorsal edge somewhat concave but roughly following the fold to tornus. Apical area beyond the white transverse fascia somewhat darker than the usual wing color, with suggestions of longitudinal stripes, the most notice-



able directly from the fascia to just below the apex. Cilia light gray, faintly lined parallel to wing margin. Hind wing light fuscous, darker apically; cilia light fuscous. Legs dark fuscous or grayish fuscous, irrorated whitish, and white at apices and joints. Expanse, 19 to 22 mm.

Type, male, No. 2965, Museum California Academy of Sciences, reared June 7, 1929, from a larva collected on *Arbutus menziesii* Pursh (Madrone) at Mill Valley, Marin County, California; allotype, female, No. 2966, Museum California Academy of Sciences, reared June 12, 1927, from a larva with the same data. A series of eighteen paratypes are included, part of them reared from Mill Valley larvæ and part from Phoenix Lake (Marin County) larvæ. There are also collected adults, all from Mill Valley, part taken by Mr. E. P. Van Duzee. These are in the collections of Miss Braun, the National Museum, the Academy, and the author.

The male and female genitalia as shown by certain designated paratypes are diagrammed in Figs. 2a, 2b, 2c, 2d. The main features of the male genitalia are the produced uncus, the gnathos, the ventrad projections of the tegumen, the large midventral posterior lobe of the vinculum, and the shape of the ædœagus. This is compared under the next species.

The larva is comparatively robust and approximately 17 mm. long when full grown. Body yellowish green; tubercles indicated as small conspicuous black dots; hairs moderately long, prominent, black; body generally becoming bright pinkish before pupation. Thoracic shield more yellowish or ochraceous than the body, variously shaded with black usually along the lateral or posterior margins. Anal plate more yellowish than body; anal fork present. Thoracic legs light yellow, dark fuscous on tibia and tarsi. Crochets in complete circle, heavier outwardly, unevenly triordinal, apparently 55 to 60. Head light brown or yellow-brown, eyes blackish brown.

This larva is typically found in a roll at the outer edge of that portion of the leaf it is skeletonizing. This roll is securely anchored, is open at both ends, and is made larger as the larva grows. The leaves first attacked are those that had developed the previous year, as the new growth has not appeared when this caterpillar begins to feed in the early spring. The habits

of the mature larvæ are not known from field observations, but they live between new leaves in the laboratory. They are to be collected in Marin County, at Mill Valley and Phoenix Lake, during March, April and possibly May; collecting dates are from March 19 to April 16.

***Gelechia manzanitæ* Keifer, new species**

This species is very similar to the foregoing and does not need to be described in detail as most of the description would be a reiteration of that of *arbutina*. The main difference in the pattern of the forewings is on the basal part of the wing where instead of a black triangle there is an oblique black bar, from well within the costa at the basal fifth it runs across the fold and ends on the outer side of a scale tuft well within the dorsal margin at about the basal fourth. In addition the apical joint of the palpi is not as white, especially at the tip. Wing expanse of the various specimens is from 15 mm. to 19.5 mm, averaging somewhat smaller than *arbutina*.

Type, male, No. 2967, Museum California Academy of Sciences, reared June 26, 1927, from a larva collected by the writer at Phoenix Lake, Marin County, California, feeding in a new terminal of *Arctostaphylos* sp. (*manzanita*). Allotype, female, No. 2968, Museum California Academy of Sciences, reared June 30, 1927, from a larva having the same data. In addition sixty-nine paratypes are included: from Phoenix Lake, the Marysville Buttes, Sutter County, Calif., and Big Bend Mountain (above Las Plumas), Butte County, Calif. These are distributed among the collections of Miss Braun, the National Museum, the Academy, and the author.

This large series of adults from these widely separated localities shows considerable variation in size and in larval coloration, but the color of the adults does not vary, nor do the genitalia to any extent. Those from Phoenix Lake average about 18.5 mm. in wing expanse, whereas the other two groups from the inland localities average 16.5 mm. Adults from Phoenix Lake larvæ emerged from June 15 to 30; Marysville Butte larvæ appeared as adults from May 31 to June 15; the Big Bend Mountain individuals came out about the same time as those from Phoenix Lake.

The male genitalia of this species (Figs. 3a, 3b, 3c, 3d, 3e) can immediately be seen to differ from that of *arbutina*: 1. In the shape of the uncus and gnathos; 2. In the shorter projections from the tegumen; 3. In the two ventral lobes of the vinculum; 4. In the shape of the ædœagus. The male genitalia of specimens of *Gelechia scabrella* Busck received from Dr. William Barnes have been examined and proves that species to belong to the same section of the genus as the new species, the main differences being only in degree. *Gelechia walsinghami* Dietz and *pennsylvanica* Dietz seem also to belong to this series, but can immediately be separated by the pattern of the forewings.

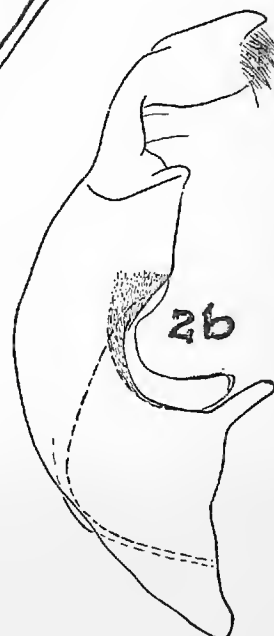
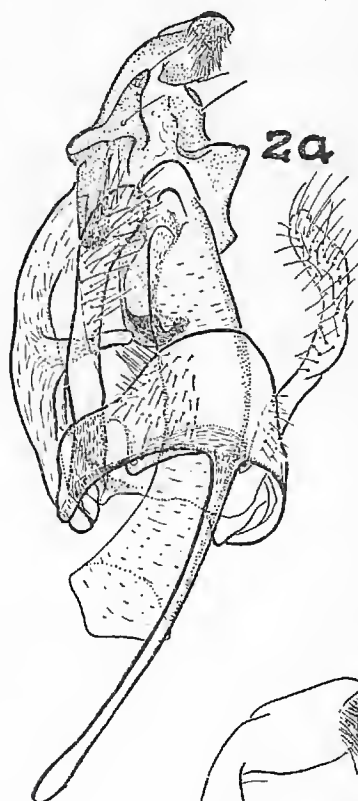
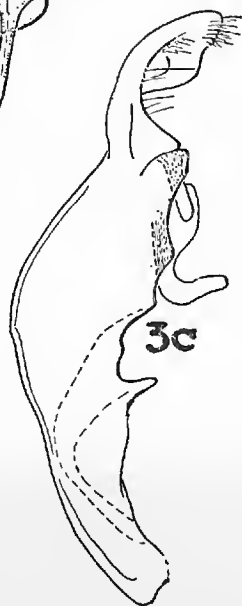
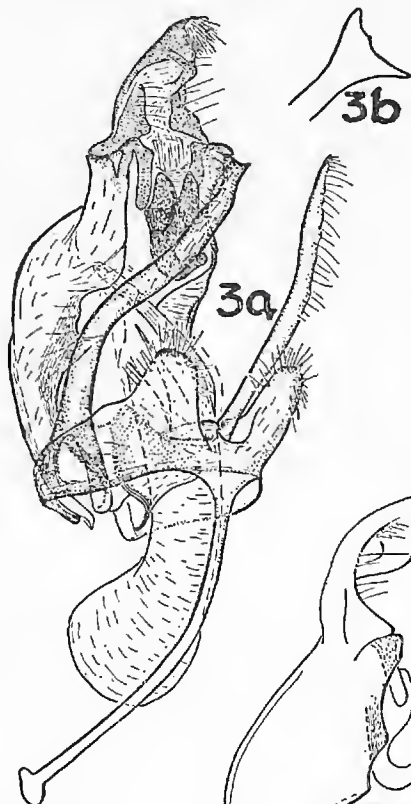
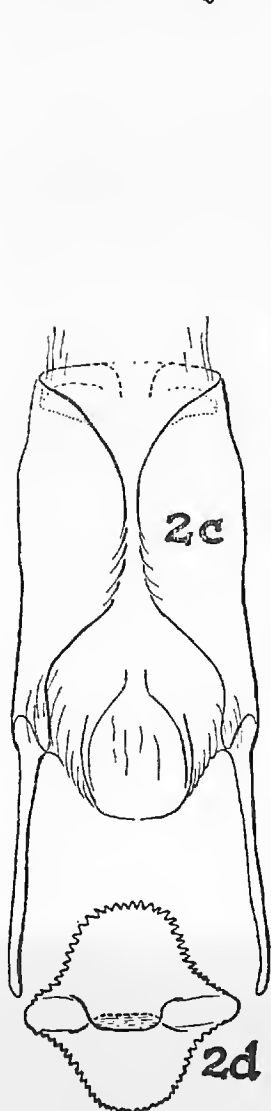
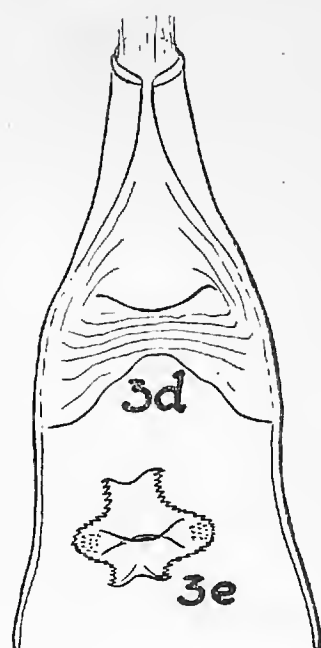
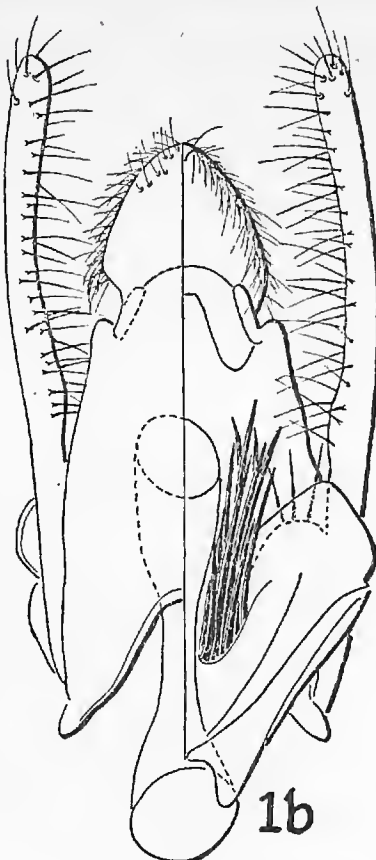
The larvæ of *manzanitæ* were collected May 14 to 30 at Phoenix Lake, April 20 to May 11 at the Marysville Buttes, and May 23 to 28 on Big Bend Mountain. At least three species of *Arctostaphylos* are attacked in this range. On April 26 the larvæ were found skeletonizing the old leaves, as the new growth had not yet appeared. The mature larvæ are found in spune heads of new growth, eating holes in the leaves.

A Phoenix Lake larva when full grown and not yet ready to pupate is from 13 to 14.5 mm. long; body light yellow green, with a subdorsal reddish or reddish purple longitudinal stripe from the thoracic shield to the ninth abdominal segment; a few of the body tubercles slightly fuscous; hairs moderate in length, brownish fuscous; thoracic shield brown and blackish laterally, or black with a narrow median line; crochets in complete circle, heavier outwardly, 45 to 47, unevenly triordinal. Head dark brown to black.

The Marysville Butte larvæ are smaller in average and about the same in color except that the subdorsal stripe is indicated by an almost faint fuscous color. The Big Bend Mountain larvæ are, if anything, still smaller, some only 12 mm. long when full grown; the head and shield is never black and the subdorsal stripe is only shortly indicated on part of the individuals by faint fuscous shading.

The pupæ of *manzanitæ* and *arbutina* are very similar; that of *manzanitæ* being 6.5 to 8 mm., and *arbutina* 8 to 8.5 mm. They are dark brown, robust, the usual hair fringe on the





seventh segment, and no movable segments. In *manzanitæ* the antennæ, wings and legs end near the posterior margin of the fifth abdominal segment, while in *arbutina* they end about the middle of the segment.

#### GELECHIA PANELLA Busck

This species appears here by virtue of its food plants. An adult was obtained from Manzanita in Marin County during 1927, but the larva was not noted until specimens were taken from both Manzanita and Madrone on Big Bend Mountain, May 23 and 28, 1928.

The length of the full-grown larva of this species is approximately 16 mm. Head light yellow or yellow-brown; body yellow-green with three dorsal longitudinal (a dorsal and a subdorsal) rather wide pinkish purple stripes. The larva appears with the new growth in the spring considerably after the appearance of the two above-described species, and feeds on both Manzanita and Madrone. The adult is interesting in that it displays the reddish coloring common to a number of Manzanita insects, which include members of the Coleoptera and Hemiptera. The male genitalia would place *panella* in another section of the genus than that of *arbutina* and *manzanitæ*. The distribution in California of this species as shown by specimens in the Academy collection is: Alma, Santa Cruz County (J. O. Martin, collector); Mill Valley, Marin County (E. P. Van Duzee and M. C. Van Duzee, collectors); Phoenix Lake, Marin County (reared by the writer); and Big Bend Mountain, Butte County (reared by the writer). The adults taken on the wing were collected from March to October, proving the species to overwinter in the adult stage. The reared specimens have emergence dates from June 22 to June 29.

#### EXPLANATION OF PLATE

1a, *Epithectis californica*, lateral view of the male genitalia. 1b, *same*, composite dorsal and ventral view of the male genitalia, ventral view on right. 2a, *Gelechia arbutina*, male genitalia. 2b, *same*, side view of uncus, gnathos, and tegumen of male genitalia. 2c, *same*, basal part of the female genitalia. 2d, *same*, signum of female genitalia. 3a, *Gelechia manzanitæ*, male genitalia. 3b, *same*, variation in tip of harpe. 3c, *same*, side view of uncus, gnathos, and tegumen of male genitalia. 3d, *same*, basal part of female genitalia. 3e, *same*, signum of female.